The Impact of Subprime Residential Mortgage-Backed Securities on Moody's-Rated Structured Finance CDOs: A Preliminary Review

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INTRODUCTION/SUMMARY

The recent weakening of credit performance of subprime residential mortgage loans that were originated in 2006 has become the focus of much attention in the financial markets, as well as in the popular press. Mortgage lenders have begun to pull back from the subprime market while several specialized subprime lenders have closed down.

It is widely recognized that Structured Finance CDOs (SF CDOs) have been major buyers of subprime residential mortgage-backed securities (RMBS). Whether labeled as "subprime RMBS" or "home-equity loan" (HEL) instruments, subprime RMBS[1] tranches have accounted for an increasingly higher proportion of the collateral backing SF CDOs issued over recent years.

As a result of the increased exposure to subprime RMBS in SF CDOs, the recent credit deterioration in the loans that back at least some of those subprime RMBS pose a potential for credit deterioration to some SF CDOs. In order to provide market participants with a better understanding of the potential rating impact on Moody's-rated CDOs, we have performed a preliminary rating-sensitivity analysis on a hypothetical U.S. cash-flow SF CDO by examining a limited set of hypothetical cases of subprime RMBS portfolio deterioration.

Based on our review of the collateral backing the 2003-2006 vintage Moody's-rated SF CDOs, primarily of the cash flow variety and to a lesser extent hybrids, we found that subprime RMBS exposure averaged 45% of a portfolio, but varied greatly with a range of nearly zero to almost 90%. We then performed an analysis on a generic cash flow CDO structure to estimate the effects that various levels of defaults and downgrades of the underlying subprime RMBS collateral would have on the rated notes of the SF CDOs. Based on our testing, we found that the effects were generally mild to

1 We will generally refer to these instruments as "subprime RMBS" over the balance of this report, but the term should be understood to include "HEL" securities as well.

moderate in cases where the subprime RMBS exposure was low or even approached the observed average of 45%. But in cases where the concentration levels were higher, the potential downgrade impact on the SF CDO Notes was severe - in some cases 10 or more notches. As part of our testing we also noted that certain structural protections of the Moody's-rated deals helped mitigate some of the negative impact of collateral deterioration.

Since our analysis is based on a subset of the total subprime RMBS CDO market and a generic cash flow CDO structure, we acknowledge that our conclusions may deviate significantly from the performance of any particular deal or sub-category of subprime RMBS CDO deals. We expect to expand our research on this topic to address more focused areas of interest such as possibly, but not limited to, underlying vintage concentration, triggerless deals, synthetic deals and hybrid deals.

On Which Collateral Should We Focus?

As we have noted, subprime RMBS has been variously classified in SF CDOs as "Subprime RMBS" and as "HEL". Despite the name, nearly all "HEL" instruments are effectively subprime RMBS.

Within the subprime RMBS sector, it is the Baa (and below, if any) rated tranches that are most likely to pose concerns for SF CDOs. This is because SF CDOs have tended to purchase almost exclusively investment-grade tranches rated Baa.[2] These lower investment-grade subprime RMBS tranches will have less credit protection and will tend to exhibit more rating volatility than very highly-rated tranches. These tranches also tend to be more thinly sized within the capital structure, which will tend to exacerbate their rating volatility. The Baa-rated subprime RMBS tranches are thus the most likely collateral in SF CDOs to be vulnerable to the current subprime market stress.

Exposure of 2003-2006 Vintage SF CDOs to Subprime RMBS

As the propensity for SF CDOs to invest heavily in subprime RMBS has increased over time, recent CDO vintages tend to have high concentrations of such collateral. Thus, to get a sense as to the scope of the exposure of SF CDOs to subprime RMBS, we will focus on the 2003-2006 SF CDO vintages. We have examined the collateral pool composition for all U.S. cash-flow and hybrid SF CDOs for which collateral pool information is available including both those backed by highly-rated instruments ("High-Grade" deals) and those backed by low-investment-grade securities ("Mezzanine" deals). Because, as stated above, the collateral that poses the greatest risk is that rated in the Baa range, the mezzanine SF CDOs are more vulnerable to credit deterioration in the subprime market.

Figure 1 reports some key subprime RMBS-related collateral characteristics for Moody's-rated SF CDOs from the last four vintages as of the beginning of this year[3]. The average exposure of these observed transactions to subprime RMBS collateral is around 45% of the overall collateral pools, though a bit less for the 2003 vintage. But the variation around these averages is quite large, with transactions ranging from practically no subprime RMBS collateral to as much as 88% of the pool. In addition, the maximum concentrations are larger for the 2005 and 2006 vintages.

Figure 1

Subprime RMBS Share of SF CDO Collateral Pools by CDO Vintage (Cash Flow & Hybrid)*

Vintage	2006	2005	2004	2003
CDO Deal Count	79	82	55	34
Average Share	45%	47%	49%	41%
of which ≤Baa	22%	23%	24%	24%
Minimum	0.1%	2%	20%	4%
Maximum	88%	85%	78%	66%
Avg. # Subprime Issuers	64	62	68	63
Avg. Subprime Issuer Concentration	0.7%	0.8%	0.7%	0.6%

* - Excludes pure synthetic deals and 2006 deals without trustee data.

2 Many "mezzanine" SF CDOs have small buckets for Ba-rated collateral. Of course, collateral initially rated investment-grade may be downgraded over time.

3 Some late 2006 deals, primarily of the hybrid variety, are not included in this study. Since these deals are typically in their ramp-up period, the monthly surveillance reporting packages are not routinely delivered. We believe that inclusion of these deals would tend to increase the observed average exposure to subprime RMBS securities.

Focusing on the Baa-rated subprime RMBS instruments that pose the greatest risk to SF CDOs, the average exposure to these credits is about 22% by portfolio share for the 2006 vintage, with a range from 0.2% to 77%. The average is somewhat misleading in that SF CDOs have tended to be structured as either High-Grade (with little or no investment in Baa-rated tranches) or Mezzanine (with substantial holdings of Baa-rated instruments). This dichotomy partly accounts for the very wide range of exposures to Baa-rated subprime RMBS tranches.

To get a better understanding of the degree of Baa exposure in High-Grade as compared to Mezzanine SF CDOs, *Figures 2* and *3* present the same portfolio characteristics as we reported in *Figure 1* above, but for the two types of transactions. We have distinguished between High-Grade and Mezzanine transactions on the basis of Moody's Weighted Average Rating Factor (WARF). Those SF CDOs with a WARF above 216 (roughly the geometric mean between **A3** and **Baa1**) are treated as Mezzanine SF CDOs, while those with lower WARF values are classified as High-Grade transactions.

Figure 2

Subprime RMBS Share of High-Grade SF CDO Collateral Pools by CDO Vintage (Cash Flow & Hybrid)*

Vintage	2006	2005	2004	2003
CDO Deal Count	38	35	22	8
Average Share	44%	46%	43%	34%
of which ≤Baa	1%	1%	0.1%	0.1%
Minimum	0.1%	9%	23%	24%
Maximum	72%	68%	57%	43%
Avg. # Subprime Issuers	74	67	73	58
Avg. Subprime Issuer Concentration	0.6%	0.7%	0.6%	0.6%

* - Excludes pure synthetic deals and 2006 deals without trustee data.

Figure 3

Subprime RMBS Share of Mezzanine SF CDO Collateral Pools by CDO Vintage (Cash Flow & Hybrid)*

Vintage	2006	2005	2004	2003
CDO Deal Count	41	47	33	26
Average Share	45%	48%	53%	43%
of which ≤Baa	41%	40%	40%	31%
Minimum	2%	2%	20%	4%
Maximum	88%	85%	78%	66%
Avg. # Subprime Issuers	54	58	64	64
Avg. Subprime Issuer Concentration	0.8%	0.8%	0.8%	0.7%

* - Excludes pure synthetic deals and 2006 deals without trustee data.

We see that although the average exposures to subprime RMBS are similar for the two CDO types (around 45%), the Baa exposures are dramatically different. For Mezzanine CDOs, the Baa exposures account for the vast majority (about 90% for the 2006 vintage) of subprime RMBS collateral. By contrast, High-Grade transactions show no more than a percent or two of exposure to these instruments (which may be a result of downgrades, rather than initial purchases of Baa securities). Aside from the Baa holdings, it is also worth noting that the maximum subprime RMBS portfolio shares for the High-Grade deals tend to run around 16 to 23 percentage points lower than those for the Mezzanine transactions. Moreover, the average exposure per subprime credit is somewhat larger for the Mezzanine deals.

Mitigants to Subprime RMBS Exposure

Diversification

Though many of these transactions clearly have substantial exposures to subprime RMBS tranches, it is important to recall that most of them are at least somewhat diversified. Other sectors such as prime RMBS,

CMBS, CDOs, REITs, Auto ABS, Credit Card ABS, etc. generally account for more than half the collateral for a majority of these transactions. Of course, the few transactions with 80% or more of their pools allocated to subprime RMBS will not draw much benefit from diversification. Other potential diversification affects (such as vintage diversification, servicer/originator concentration), or lack thereof, are not addressed in this paper and may be addressed in future research reports.

Credit Enhancement

A second mitigant to subprime RMBS exposure is the relatively high level of credit enhancement required for the transactions that have focused on the subprime RMBS sector. Precisely because the pools were not as well diversified by industry as many other CDOs, the subordination (both structural subordination and excess spread) required to achieve Moody's expected loss targets for a given rating was relatively high.[4]

Structural Protections

Moody's strongly supported, and our rating methodology for some CDOs relies on, the inclusion of structural protections in CDOs that respond to "early-warning" signals associated with potentially distressed collateral.[5] In regard to the potential for downgrades of subprime RMBS collateral in SF CDOs, the most relevant of these structural features are:

- Treating Securities on Watch for Upgrade/Downgrade as if they have already been Upgraded/Downgraded
- Limiting Deeply Discounted Purchases - or applying a haircut to the par coverage ratio
- Limiting non-investment grade purchases - or applying a haircut to the par coverage ratio

In January 2006, Moody's published a note explaining the application of par "haircuts" within SF CDOs.[6] We observed in that piece that where there is a par coverage test in SF CDO structures, Moody's draws comfort from the typical structure in which "excess" Ba, B and Caa exposures are assigned par credit of only 90%, 80% and 50%, respectively in calculating the par coverage ratio. Also, the threshold above which such exposures are considered to be excessive is normally 10% for Ba-rated instruments, and zero for both B and Caa-rated collateral. (The same guidelines are typically incorporated into High-Grade SF CDO indentures, with a threshold of zero for all below-investment-grade ratings.) The article also spelled out possible par haircuts for the purchase of deeply discounted securities. Several years ago Moody's had adopted - and continues to advocate - these important structural features in our rating methodology.

Most Moody's-rated SF CDOs have indeed adopted these par haircuts in some form. Precisely in circumstances like the current one, in which a segment of the SF market is facing potential ratings pressure, the par haircuts help to provide a degree of stability for SF CDO tranche ratings[7].

Cash Flow SF CDO Ratings Impact of Potential Downgrades and Defaults of Subprime-Mortgage-Related Tranches

We do not know yet what the ultimate impact of the current credit weakness in the subprime mortgage loan market will be for Moody's-rated subprime RMBS tranches.[8] However, since the fourth quarter of 2006, Moody's has placed on watch for possible downgrade the ratings of 226 Baa-rated tranches from 139 subprime RMBS transactions. In addition, Moody's has downgraded 74 Baa-rated tranches from 50 subprime RMBS transactions over this period. The combination of watchlist and actual downgrades is approximately 4.5% of the subprime RMBS Baa ratings that we have outstanding. The number of notches by which tranches initially rated in the Baa range at the beginning of the period have been downgraded has averaged 3.9 notches. Additionally, some of the downgraded tranches remain on watch for further possible downgrades.

In order to put this activity in better perspective, we note that historically 4.2%, 20.4% and 33.9% of Baa subprime RMBS ratings have been downgraded over 1-, 3- and 5-year horizons, respectively. On average, the downgraded instruments have been downgraded a total of 4.7, 6.2 and 7.4 notches over the 1-, 3- and 5-year periods, respectively.[9]

4 To be a bit more precise, the "Moody's Asset Correlation" covenant that functions within Moody's Correlated Binomial Model-the tool used to model SF CDOs since 2004-would have suggested a high degree of correlation, requiring a high level of subordination (other things equal).
5 See "Structural Features Aimed at Enhancing CDO Ratings Stability: An Overview," Moody's *Special Report*, July 2002.
6 See "Par Haircuts in Structured Finance CDOs," Moody's *CDO RatingFactors*, Vol. II, No. 5, January 2006.
7 Note that "triggerless" deals will generally not benefit from such haircuts, though other structural features (e.g., excess subordination) could offset potential collateral deterioration. This topic will be considered for future research.
8 See "Challenging Times for the US Subprime Mortgage Market", Moody's Special Report, March 2007, for Moody's view of the current credit environment in the subprime mortgage loan market and the possible impact on the ratings of subprime RMBS.

Since we cannot yet fully identify the final extent of downgrades of subprime RMBS tranches, we consider two of many possible scenarios. First, we examine the potential impact of downgrades of the entire subprime RMBS bucket in an SF CDO over a range of one to five notches. Second, we consider varying degrees of actual losses on the subprime RMBS bucket, in addition to these downgrades. **These scenarios are meant for illustrative purposes only and do not represent Moody's expectations regarding the future rating performance of Moody's-rated subprime RMBS.**

In order to analyze these cases, we have constructed a hypothetical cash flow mezzanine SF CDO with the following characteristics that are typical of the sector: the portfolio consists of floating-rate instruments with a Weighted Average Spread (WAS) of 160 bps, Weighted Average Rating Factor (WARF) of 360 (Baa2), a Weighted Average Life (WAL) of 5.0 years, an average recovery rate of 20%, and a Moody's Asset Correlation of 20%.[10] We also assumed the par haircuts, consistent with Moody's methodology. The CDO has issued tranches with ratings ranging from Aaa to Baa2, as well as an unrated equity tranche.

It's important to note some of the deal structure assumptions that we made. The hypothetical deal structure in this particular case is a sequential cash flow deal with O/C triggers. While such a deal structure represents the characteristics of the majority of the outstanding deals in the market, more recent deals include pro-rata cash flow features in "triggerless" hybrid deals. Such alternative structures in addition to pure synthetics, will be considered in upcoming research reports.

The deal structure was analyzed using our CDOEdge waterfall tool. For users of that tool, we have added this generic structure in the CDOEdge waterfall library under the name "Subprime Impact on ABS CDOs".

Case 1: All the Subprime RMBS Collateral is Immediately Downgraded By One to Five Notches

We have seen that the share of CDO collateral allocated to Subprime RMBS in our selection varies widely across SF CDOs. We thus consider three possible levels of subprime concentration: 10% of par, 40% of par and 80% of par. While we will comment specifically on these three cases, we have included a 100% case for illustrative purposes. Roughly speaking these represent the minimum, average and maximum levels of exposure across the deals in our study.

Figure 4 relates the extent of assumed immediate downgrades of subprime RMBS collateral to the ratings of the tranches issued by our hypothetical CDO. For example, if we consider the case in which the subprime RMBS bucket accounts for 10% of portfolio par, we see that the one-notch subprime RMBS downgrade scenario has no impact on the ratings of the CDO tranches and the two- and three-notch downgrade scenarios results in only one tranche being downgraded by one notch[11]. It is important to note that while there are few downgrade actions in these cases, we did assume some "rating cushion" in the initial structure (but not enough to warrant a higher rating). While it is not unusual for deals to be structured with some cushion, more aggressively structured deals would most likely experience downgrades of more tranches in some of the scenarios in this case. Interestingly, in the five notch downgrade scenario, all the tranches revert back to their original ratings. This is due to the B-rated par haircut (mentioned above) being applied to the entire 10% of the subprime RMBS. This caused the par coverage tests to divert cashflows to delever the structure relatively early and in greater amounts. In the two through three notch downgrade scenarios, none of the assets exceeded the Ba threshold amount of 10% and, therefore, were not applied any par haircuts.

9 See "Structured Finance Rating Transitions: 1983-2006," Moody's *Special Report*, January 2006. The statistics reported above for the 5-year horizon are based on a small number of tranches and, as a result, may not provide an accurate estimate of the rating volatility over a 5-year horizon.

10 To simplify this preliminary analysis, we have not varied the Moody's Asset Correlation (MAC) value with the concentration of subprime RMBS in the pool. In general, a more concentrated pool would tend to have a higher MAC value, other things equal.

11 In many of the scenarios for both Case 1 and Case 2, we see that the Baa2 tranche did not suffer as many notch downgrades as the A1 tranche. This could be attributed to various reasons including the thickness of the tranches, the size of the cushions relative to the respective hurdles and the width of the expected loss band for each rating. While the decline in the number of rating notches may not have been as severe, the absolute increases in expected losses were more severe for the Baa2 tranche.

Figure 4

Impact of Hypothetical Subprime RMBS Downgrades on SF CDO Tranche Ratings

Subprime Bucket =10%

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0
Aaa	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0
Aa1	Aa1	0	Aa1	0	Aa1	0	Aa1	0	Aa2	1	Aa1	0
A1	A1	0	A1	0	A2	1	A2	1	A2	1	A1	0
Baa2	Baa2	0	Baa2	0	Baa2	0	Baa2	0	Baa3	1	Baa2	0

Subprime Bucket =40%

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0
Aaa	Aaa	0	Aaa	0	Aaa	0	Aa1	1	Aa2	2	A2	5
Aa1	Aa1	0	Aa1	0	Aa2	1	A1	3	A2	4	Baa3	8
A1	A1	0	A2	1	A2	1	Baa1	3	Baa2	4	Ba2	7
Baa2	Baa2	0	Baa2	0	Baa2	0	Baa3	1	Ba1	2	B2	6

Subprime Bucket =80%

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aa1	1	Aa2	2	Aa2	2
Aaa	Aaa	0	Aaa	0	Aa1	1	A1	4	A3	6	A3	6
Aa1	Aa1	0	Aa2	1	A1	3	Baa1	6	Baa3	8	Baa3	8
A1	A1	0	A3	2	Baa1	3	Ba1	6	Ba3	8	Ba3	8
Baa2	Baa2	0	Baa3	1	Ba1	2	Ba3	4	B3	7	B3	7

Subprime Bucket =100%

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aa1	1	Aa3	3	A2	5
Aaa	Aaa	0	Aa1	1	Aa2	2	A2	5	Baa2	8	Ba1	10
Aa1	Aa1	0	A1	3	A2	4	Baa2	7	Ba1	9	Ba3	11
A1	A1	0	Baa2	4	Baa3	5	Ba2	7	B2	10	Caa1	12
Baa2	Baa2	0	Ba1	2	Ba2	3	B3	7	Caa1	8	Caa3	10

When we move to the 40% subprime RMBS bucket case- roughly the average exposure in our study-the assumed subprime RMBS downgrades do have a material impact on some of the CDO tranche ratings. We note that the downgrade of 40% of the collateral pool by 3 notches has no more than a 3-notch impact on the rating of any CDO tranche. The impact on the mezzanine Aaa notes is one notch and there is no impact on the senior Aaa notes. When all the subprime collateral is downgraded by a full five notches, the SF CDO tranche ratings decline by up to 8 notches.

Of course, the effects become more dramatic when we turn to the 80% subprime RMBS bucket. The one-notch across-the-board subprime RMBS downgrade has no impact on the CDO tranche ratings, but a 3-notch downgrade of the subprime RMBS collateral produces downgrades of up to six notches for the Aa1 and A1 rated notes. The five-notch RMBS collateral downgrade scenario implies CDO tranche downgrades of up to 8 notches, and even the senior Aaa tranche drops by two notches.

Case 2: 10% of the Subprime RMBS Collateral is Immediately Assumed to Default and the Remainder is Immediately Downgraded

We now repeat the exercise above, but with the additional assumption that 10% of the instruments in the subprime RMBS pool immediately default with an immediate 20% recovery[12]. The non-defaulted subprime RMBS are downgraded as before.[13]

12 According to "Default and Loss Rates of Structured Finance Securities: 1993-2005," Moody's *Special Report*, April 2006, the average loss rate for impaired Moody's-rated HEL securities was about 33% of the original balance (The next annual version of this publication is scheduled for release in April 2007.) While the 20% recovery assumption, in accordance with our CDO rating methodology, appears to be conservative, we do expect recovery rates to be lower than historical averages during the volatile market environments we are assuming in our analysis.

13 Moody's model also considers the possibility that any combination of the remaining collateral instruments may default.

Figure 5 shows the outcomes for these more severe scenarios. Interestingly, the hypothetical transaction with 10% subprime RMBS exposure is still not very sensitive to the assumed subprime RMBS distress. As a result of a two-notch downgrade of all the subprime RMBS collateral only the two most junior tranches would suffer by a single notch.

Figure 5

Impact of Hypothetical Subprime RMBS Downgrades and Defaults on SF CDO Tranche Ratings

Subprime Bucket =10% (1% of total collateral immediately defaults)

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0
Aaa	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0
Aa1	Aa1	0	Aa1	0	Aa1	0	Aa2	1	Aa2	1	Aa2	1
A1	A1	0	A1	0	A2	1	A2	1	A3	2	A2	1
Baa2	Baa2	0	Baa2	0	Baa3	1	Baa3	1	Baa3	1	Baa2	0

Subprime Bucket =40% (4% of total collateral immediately defaults)

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aaa	0	Aa1	1
Aaa	Aaa	0	Aaa	0	Aa1	1	Aa2	2	Aa3	3	A2	5
Aa1	Aa1	0	Aa2	1	Aa3	2	A2	4	Baa1	6	Baa2	7
A1	A1	0	A3	2	Baa1	3	Baa3	5	Ba1	6	Ba3	8
Baa2	Baa2	0	Baa3	1	Ba1	2	B1	5	B3	7	Caa1	8

Subprime Bucket =80% (8% of total collateral immediately defaults)

Scenario	No RMBS Downgrades		1-notch RMBS Downgrade		2-notch RMBS Downgrade		3-notch RMBS Downgrade		4-notch RMBS Downgrade		5-notch RMBS Downgrade	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aaa	0	Aa2	2	Aa3	3	A2	5
Aaa	Aaa	0	Aa2	2	A1	4	Baa1	7	Baa3	9	Ba1	10
Aa1	Aa3	2	A2	4	Baa2	7	Ba1	9	Ba3	11	B1	12
A1	Baa2	4	Ba1	6	B1	9	B3	11	Caa2	13	Caa3	14
Baa2	B3	7	Caa2	9	Caa3	10	Ca	11	Ca	11	C	12

Subprime Bucket =100% (10% of total collateral immediately defaults)

Scenario	No RMBS		1-notch RMBS		2-notch RMBS		3-notch RMBS		4-notch RMBS		5-notch RMBS	
	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch	Rating	Notch
Aaa	Aaa	0	Aaa	0	Aa1	1	Aa3	3	A2	5	Baa1	7
Aaa	Aaa	0	Aa3	3	A3	6	Baa3	9	Ba2	11	Ba3	12
Aa1	A1	3	Baa1	6	Ba1	9	Ba3	11	B2	13	Caa1	15
A1	Ba1	6	B1	9	Caa1	12	Caa3	14	Ca	15	Ca	15
Baa2	Ca	11	Ca	11	C	12	C	12	C	12	C	12

For the 40% subprime RMBS bucket transaction, the impact of portfolio deterioration is more severe than in the downgrade-only case, but still not terribly dramatic as long as the subprime collateral is downgraded by no more than two notches. With subprime RMBS downgrades of 5 notches, the senior Aaa notes would be downgraded by one notch.

Finally, the CDO tranche ratings suffer significantly when the subprime RMBS bucket comprises 80% of the collateral pool. Though the Aaa tranche ratings are not affected by the immediate default of 8% of collateral in the absence of simultaneous downgrades, they ultimately fall 2 to 7 notches when the defaults are coupled with a three-notch downgrade of the remaining subprime instruments. In the worst case presented above, only the senior Aaa tranche remains investment-grade.

Conclusion

We have provided here a preliminary view of the potential impact of subprime RMBS exposure on cash flow SF CDO tranche ratings. We observed that, for the deals in our study, such exposures vary widely from deal to deal, averaging around 45% of total collateral for recent vintages. We then illustrated the possible effects on a hypothetical cash flow CDO of various combinations of assumed subprime RMBS downgrades and defaults, some of which were quite severe. This stylized CDO structure, which we created to aid in our analysis assumed no benefit or penalty associated with potential collateral manager investment strategies.

Given these assumptions, we found that the effects were generally mild to moderate for SF CDOs with exposure to subprime RMBS up to the observed average, but could be severe for the most heavily exposed transactions. We intend to continue to closely monitor developments in the RMBS subprime market and will continue to provide greater clarity as it relates to the SF CDO market. We will expand our research to include alternative deal structures, such as triggerless and pro rata pay SF CDOs, where there may be differences from the results shown above. Additionally, we will continue to study the effect of other cited risk factors on the performance of SF CDOs, such as: collateral vintage, servicer concentration, originator concentration and collateral manager actions.

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